EPOXY TECHNOLOGY

EPO-TEK® 353ND

Technical Data Sheet

For Reference Only

High Temperature Epoxy

Number of Components:	Two	Frozen Syringe	Minimum Bond Line Cure Schedule*:	
Mix Ratio By Weight:	10:1		150°C	1 Minute
Specific Gravity:		1.18	120°C	5 Minutes
Part A	1.20		100°C	10 Minutes
Part B	1.02		80°C	30 Minutes
Pot Life:	≤ 3 Hours	2 Hours		
Shelf Life:	One year at 23°C	Six months at -40°C		

*Note: Container(s) should be kept closed when not in use. *Please see Applications Note available on our website.*
-TOTAL MASS SHOULD NOT EXCEED 25 GRAMS -
*-- IF PART A CRYSTALIZES IN STORAGE, PLACE CONTAINER IN A WARM OVEN UNTIL CRYSTALIZATION DISAPPEARS. ALLOW TO COOL TO ROOM TEMPERATURE BEFORE MIXING WITH THE PART B HARDENER *Please refer to Tech Tip #7 on our website --*

Product Description:

EPO-TEK® 353ND is a two component, high temperature epoxy designed for semiconductor, hybrid, fiber optic, and medical applications. It is one of the most popular EPO-TEK® brand products, and is known throughout the world for its performance and reliability. Also available in a single component frozen syringe.

EPO-TEK® 353ND Advantages & Application Notes:

- Reasonable pot-life that allows for low temperature curing to be realized. It has an amber color change upon cure.
- Passes NASA low outgassing standard ASTM E595 with proper cure - http://outgassing.nasa.gov/
- Semiconductor suggested applications: wafer-wafer bonding of CSP; fabrication of MEMs devices; flip chip underfill.
- Hybrid suggested applications: providing near hermetic seals and UHV seals in sensor devices, resisting high temperature packaging
  - Down-Hole petrochemical fiber optic sensors, resisting >200°C field conditions
- Fiber optic adhesive designed to meet Telecordia 1221 - suggested applications:
  - Sealing fiber into ferrules, transmitting light in the optical pathway from 800- 1550 nm range
  - Fiber component packaging; adhesive for active alignment of optics, environmental seal of opto-package, V-groove arrays
- Medical suggested applications:
  - Potting fiber optic bundles into ferrules for light guides and endoscopes; capable of resisting several sterilization techniques including ETO, gamma, ION beam, H202 plasma, and >200 autoclave steam cycles; excellent adhesion to surfaces including SST, diamond, titanium, brass, ceramics, glass and most plastics.
  - Adhesive for catheter devices including stents and guide wires.
  - Certified to USP Class VI and ISO 10993 biocompatibility standards for medical implants.
  - Compatible with CIDEX® OPA sterilization.
- Electronics Assembly suggested applications:
  - Used as dielectric layer in the fabrication of capacitors; laminating PZT ferroelectrics found in ultrasound or ink-jetting devices
  - Impregnating and insulating copper coil windings in motors and inductor coils. Bonding ferrite cores and magnets.
  - Structural grade epoxy found in hard-disk drive devices; bonding of SST metals, kapton, and magnets

Typical Properties: ***(To be used as a guide only, not as a specification. Data below is not guaranteed. Different batches, conditions and applications yield differing results; Cure condition: 150°C/1 hour; * denotes test on lot acceptance basis)***

Physical Properties:	
***Color: Part A:** Clear (Gardner <5) **Part B:** Amber (Gardner <18)	**Weight Loss:**
***Consistency:** Pourable liquid	**@ 200°C:** 0.22%
***Viscosity (@ 50 RPM/23°C):** 3,000 – 5,000 cPs	**@ 250°C:** 0.39%
Thixotropic Index: N/A	**@ 300°C:** 0.87%
***Glass Transition Temp.(Tg):** ≥ 90°C (Dynamic Cure 20—200°C /ISO 25 Min; Ramp -10—200°C @ 20°C/Min)	**Operating Temp:** **Continuous:** - 55°C to 250°C
Coefficient of Thermal Expansion (CTE):	**Intermittent:** - 55°C to 350°C
Below Tg: 54 x 10^{-6} in/in/°C	**Storage Modulus @ 23°C:** 516,912 psi
Above Tg: 206 x 10^{-6} in/in/°C	**Ions:** **Cl^-** 329 ppm
Shore D Hardness: 85	**Na^+**
Lap Shear Strength @ 23°C: > 2,000 psi	**NH_4^+** 409 ppm
Die Shear Strength @ 23°C: ≥ 15 Kg / 5,100 psi	**K^+** 5 ppm
Degradation Temp. (TGA): 412°C	**Particle Size:** N/A
Optical Properties @ 23°C:	
Refractive Index @ 23°C (uncured): 1.5694 @ 589 nm	**Spectral Transmission:** > 50% @ 550 nm; > 98% @ 800-1000 nm; > 95% @ 1100 - 1600 nm
Electrical & Thermal Properties:	
Thermal Conductivity: N/A	**Volume Resistivity @ 23°C:** ≥ 1.8 x 10^{13} Ohm-cm
Dielectric Constant @ 23°C (1 KHz): 3.17	**Dissipation Factor @ 23°C (1 KHz):** 0.005

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